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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,221	04/02/2004	Takayuki Nakamoto	43888-310	7325

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MCDERMOTT, WILL & EMERY  
600 13th Street, N.W.  
WASHINGTON, DC 20005-3096

EXAMINER
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CHUO, TONY SHENG HSIANG

ART UNIT	PAPER NUMBER
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1745

MAIL DATE	DELIVERY MODE
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06/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/816,221	<b>Applicant(s)</b> NAKAMOTO ET AL.	
	<b>Examiner</b> Tony Chuo	<b>Art Unit</b> 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 05 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

1. Claims 1-4 and 6-9 are currently pending. Claim 5 has been cancelled. The amended claims do overcome the previously stated double patenting, 102, and 103 rejections. However, upon further consideration, claims 1-4 and 6-9 are rejected under the following new double patenting and 103 rejections. This action is made FINAL as necessitated by the amendment.

### *Double Patenting*

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claim 9 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3-5 of copending application

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no. 10/982,056 in view of Yamamoto et al (US 2003/0054249). The copending application no. 10/982,056 discloses an energy device comprising a negative active material thin film that has a multi-layered configuration including at least two silicon thin films wherein a compound of silicon and oxide is present in the interface layer.

However, the copending application no. 10/982,056 does not expressly teach a silicon oxide layer that has an average thickness of 0.2 to 1000 nm. The Yamamoto reference teaches a negative electrode active material that has silicon oxide film with a thickness of 1.6 nm (See paragraph [0105]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the negative active material thin film of copending application no. 10/982,056 to include a silicon oxide layer that has an average thickness of 0.2 to 1,000 nm in order to reduce the hydrofluoric acid level in the electrolyte (See paragraph [0130]).

However, the copending application no. 10/982,056 as modified by Yamamoto et al does not expressly teach an alloy comprising Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn, and Fe. The Fukui reference discloses a negative electrode active material for a non-aqueous rechargeable battery comprising silicon and/or silicon alloy such as Si-Ni alloy and Si-Cu alloy (See Abstract and paragraph [0035]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the copending application no. 10/982,056/Yamamoto negative electrode active material to include an alloy comprising Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn, and Fe in order to prevent exfoliation

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of the active material from the current collector during charge and discharge reactions that result in expansion and contraction of the active material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

4. Claim 9 is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 3 of copending application No. 10/979,637 in view of Yamamoto et al (US 2003/0054249). The copending application no. 10/979,637 discloses an energy device comprising a negative active material thin film that contains silicon as a main component wherein part of the silicon contained in the negative active material thin film is an oxide.

However, the copending application no. 10/979,637 does not expressly teach a silicon oxide layer that has an average thickness of 0.2 to 1000 nm. The Yamamoto reference teaches a negative electrode active material that has silicon oxide film with a thickness of 1.6 nm (See paragraph [0105]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the negative active material thin film of copending application no. 10/979,637 to include a silicon oxide layer that has an average thickness of 0.2 to 1,000 nm in order to reduce the hydrofluoric acid level in the electrolyte (See paragraph [0130]).

However, the copending application no. 10/979,637 as modified by Yamamoto et al does not expressly teach an alloy comprising Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn, and Fe. The Fukui reference discloses a negative electrode active material for a non-aqueous

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rechargeable battery comprising silicon and/or silicon alloy such as Si-Ni alloy and Si-Cu alloy (See Abstract and paragraph [0035]). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the copending application no. 10/979,637/Yamamoto negative electrode active material to include an alloy comprising Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn, and Fe in order to prevent exfoliation of the active material from the current collector during charge and discharge reactions that result in expansion and contraction of the active material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamamoto et al (US 2003/0054249) in view of Fukui et al (JP 2002-075332).

The Yamamoto reference discloses a non-aqueous electrolyte secondary battery using a negative electrode active material capable of absorbing/desorbing lithium comprising: an silicon layer "3b" that is a thin film and a silicon oxide layer "5b" formed

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on the silicon layer that has a thickness of 1.6 nm (See paragraph [0072],[0105]). It also discloses an amorphous silicon material (See paragraph [0100]).

Examiner's note: It is implicit from the teachings of Yamamoto that the silicon oxide formed by vapor deposition would have a thickness in the range of  $\pm 50\%$  of the average thickness since it is well known in the art that the vapor deposition process forms a very uniform layer (See paragraph [0101]).

However, Yamamoto et al does not expressly teach an alloy comprising Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn, and Fe. The Fukui reference discloses a negative electrode active material for a non-aqueous rechargeable battery comprising silicon and/or silicon alloy such as Si-Ni alloy and Si-Cu alloy (See Abstract and paragraph [0035]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Yamamoto negative electrode active material to include an alloy comprising Si and at least an element selected from the group consisting of Ti, Co, Ni, Cu, Mg, Zr, V, Mo, W, Mn, and Fe in order to prevent exfoliation of the active material from the current collector during charge and discharge reactions that result in expansion and contraction of the active material (See paragraph [0016]).

### ***Response to Arguments***

7. Applicant's arguments with respect to claims 1-9 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571) 272-0717. The examiner can normally be reached on M-F, 8:30AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.



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Status information for unpublished applications is available through Private PAIR only.

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TC

  
JONATHAN CREPEAU  
PRIMARY EXAMINER